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Indian Standard

SPECIFICATION FOR
COLD-ROLLED STAINLESS STEEL
STRIPS FOR RAZOR BLADES

UDC 669·14·018·8 — 418·2 — 122·2 : 687·53·052 : 672 — 715·3

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1980

AMENDMENT NO. 2 DECEMBER 1992
TO
IS 9294 : 1979 SPECIFICATION FOR COLD-ROLLED STAINLESS STEEL STRIPS FOR RAZOR BLADES

(*Page* 6, *clause* **10.1**) — Substitute the following for the existing clause:

'**10.1** The dimensions and tolerances on width and thickness of cold-rolled strips shall be as follows:

Width	22.40 ± 0.05 mm
Type	*Thickness*, mm
a) Thick	0.127 ± 0.007
b) Medium	0.114 ± 0.007
c) Standard	0.100 ± 0.005
d) Thin	0.080 ± 0.005

(MTD 16)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 1 MARCH 1983

TO

IS:9294-1979 SPECIFICATION FOR COLD-ROLLED STAINLESS STEEL STRIPS FOR RAZOR BLADES

Alteration

(*Page 4, clause 4.1*) - Substitute the following for the existing clause:

'4.1 The ladle analysis of steel shall be as given below. The analysis of steel shall be carried out either by the method specified in IS:228* and its relevant parts or any other established instrumental/ chemical method. In case of dispute the procedure given in IS:228* and its relevant parts shall be referee method. However, where the method is not given in IS:228* and its relevant parts, the referee method shall be agreed to between the purchaser and the manufacturer:

Constituent	*Percent*
Carbon	0.60 to 0.72
Manganese	0.40 to 1.0
Silicon	0.5, *Max*
Sulphur	0.030, *Max*
Phosphorus	0.040, *Max*
Chromium	12.0 to 14.0,

(SMDC 19)

Reprography Unit, ISI, New Delhi, India

Indian Standard

SPECIFICATION FOR COLD-ROLLED STAINLESS STEEL STRIPS FOR RAZOR BLADES

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(*Continued on page* 2)

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(*Continued on page* 8)

Indian Standard

SPECIFICATION FOR COLD-ROLLED STAINLESS STEEL STRIPS FOR RAZOR BLADES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 20 October 1979, after the draft finalized by the Alloy Steels and Special Steels Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Since long a need has been felt by razor blade industry for a national standard covering the requirements for steel strips for the manufacture of razor blades. A major portion of this steel is being imported at present. It is felt that the publication of this standard will bring many manufacturers in this field to help the Indian blade industry.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expression the result of a test, shall be rounded off in accordance with IS : 2 - 1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for cold-rolled stainless steel strips for the manufacture of razor blades.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to supply of cold-rolled stainless steel strips shall conform, to IS : 1387-1967†.

2.2 Cold-rolled stainless steel strip shall be supplied in annealed and light cold rolled condition.

2.3 Cold-rolled stainless steel strip shall be supplied in the form of coils.

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*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

3. MANUFACTURE

3.1 Strips shall be manufactured from steel made by an electric process. In case any other process is employed in the manufacture, prior approval of the purchaser shall be obtained.

4. CHEMICAL COMPOSITION

4.1 The ladle analysis of steel when determined in accordance with the appropriate part of IS : 228* shall be as given below:

Constituent	*Percent*
Carbon	0·60 to 0·72
Manganese	0·40 to 1·0
Silicon	0·5 *Max*
Sulphur	0·030 *Max*
Phosphorus	0·040 *Max*
Chromium	12·0 to 14·0

4.2 Product Analysis — The permissible variation in the case of product analysis from the limits specified in **4.1** shall be as given below:

Constituent	*Variation Over the Specified Maximum or Under the Minimum Limits, Percent*
Carbon	0·03
Manganese	0·04
Silicon	0·03
Sulphur	0·005
Phosphorus	0·005
Chromium	0·15

NOTE — Variations shall not be applicable both over and under the specified limits in several determinations in a heat.

4.3 Residue Elements — The following elements shall not be added to the steel and shall not exceed the following limits:

Constituent	*Percent*
Nickel	0·50 *Max*
Molybdenum	0·50 *Max*
Copper	0·35 *Max*

---

*Methods of chemical analysis of pig iron, cast iron and plain carbon and low alloy steels (*revised*). (Issued in various parts).

5. HARDNESS TEST

5.1 One sample per cast per heat treatment batch per thickness shall be taken for the hardness test.

5.2 Hardness of cold-rolled steel strip shall be tested with the micro hardness tester. The hardness testing shall be carried out according to the Vicker's method (*see* IS : 1501-1968*) and the load on the indentor diamond (the test load) should be chosen as high as possible, avoiding however, any form of deformation on the reverse side of the strip. A load of 400 to 1 000 g is recommended. The hardness of the strip shall be between 250 to 330 HV in the annealed condition.

6. MICROSTRUCTURE

6.1 Microstructure of steel strip in the supplied condition when examined shall have spheroidized finely dispersed alloy carbides in a matrix of ferrite.

6.2 Carbide Density — The carbide density shall be measured preferably by taking a photograph of the micro-structure of the steel at 1 000 × magnification and counting the number of carbides in an area of 1 cm^2. For better average, it is recommended that a minimum area of 9 cm^2 be selected and the number of carbide particles counted, from which the number of carbide particles per square cm can be calculated. The carbide density shall be minimum 25 per cm^2 at a magnification of 1 000 ×.

7. FREEDOM FROM DEFECTS

7.1 The cold-rolled steel strip shall be free from harmful surface defects, such as scales, rust, blisters, laminations, pitting, cracked edges, etc.

8. RETEST

8.1 Should any of the test pieces selected fail to pass any of the tests specified in this standard, two further samples shall be selected from the same lot for testing in respect of each failure. Should the test pieces from both these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirements of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be deemed as not conforming to this standard.

---

*Method for Vickers hardness test for steel (*first revision*).

9. EDGE CONDITION

9.1 Cold-rolled steel strip shall have slit edges reasonably free from burrs.

10. DIMENSIONS AND TOLERANCES

10.1 The dimensions and tolerances on width and thickness of cold-rolled strips shall be as follows:

Width	22·40 ± 0·05 mm
Thickness:	
a) Thick	0·127 ± 0·007
b) Medium	0·100 ± 0·005
c) Thin	0·080 ± 0·005

10.2 Camber

10.2.1 The transverse variation of thickness shall not exceed 0·005 mm.

10.2.2 *Edge Camber (Straightness)* — There shall be no lateral bends or edge camber of greater magnitude than 10 mm in 2 metres.

10.2.3 *Edge Ripple* — Only slight amount of edge ripple may be present.

10.2.4 *Finish* — The surface should have a regular standard fine finish.

11. PACKING

11.1 Cold-rolled steel strip coils shall be suitably packed to prevent them from rusting and damage during transit. As a special case against rust, suitable preventives may be applied on the coil before packing, if the purchaser demands.

12. MARKING

12.1 Every coil of strip shall be legibly marked with:

a) Name or trade-mark of the manufacturer,

b) Size, and

c) Cast number or any other identification mark by which coil may be traced to the cast from which it was made.

12.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

(*Continued from page* 2)

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Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 $kg.m/s^2$
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure stress	pascal	Pa	1 Pa = 1 N/m^2

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